



PHILADELPHIA'S PLAN FOR RIVER RECREATION

TECHNICAL APPENDIX

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Philadelphia's Plan for River Recreation

Technical
Appendix

CITY OF PHILADELPHIA

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Item 1: Prototypical Designs of Recreation Access Points

Schematic designs have been prepared showing the possible treatment of different kinds of land areas for recreational access. These designs include a wide variety of facilities for supporting recreational activity, and hence represent a wide range in construction costs. It is not possible at this early stage in the planning process to identify with any degree of certainty access points on land which is not presently reserved for public recreational use.

The following factors beneficially affect a site's suitability and desirability for recreation.

1. The site is at a location along the riverfront for which there is an unmet demand for recreation.
2. The site is available for public access (whether or not acquired by the public) and is compatible with the long-term planned use of the land.
3. There is adequate land area, car and pedestrian access, and utility lines to serve the public at expected levels of usage.
4. The site can be improved in a way which makes it safe for public use and protects adjacent landowners from unwarranted intrusion.
5. The site makes use of positive visual and environmental qualities of its riverfront

setting and is not unduly affected by noise, odor, blight and other nuisances.

6. The site can be improved at a cost that makes it a feasible project, whether paid for from public or private sources, or by a combination of funding sources.

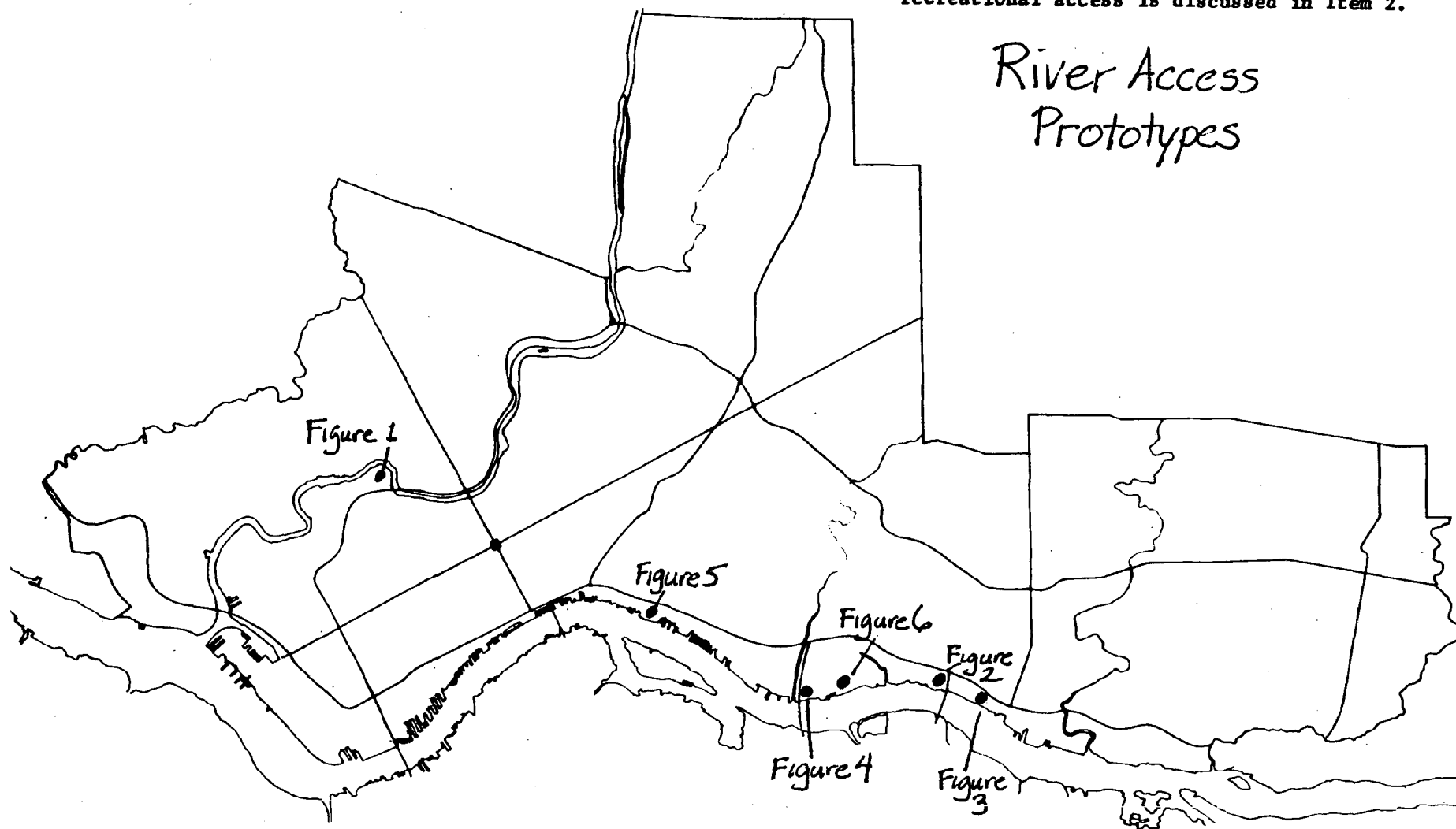
The level of funding for improvements will influence, in a fundamental way, the kind of recreation which a riverfront parcel will support. A major recreation project (costing perhaps in excess of \$1 million) might have the following facilities: paved parking and walkways, landscape plantings, benches, picnic facilities, lighting, restrooms, play equipment and fields, concession stand and maintenance building. A medium-scale recreation project, costing perhaps \$250,000, would have a more limited set of improvements: paved parking and walkways, landscape plantings and benches; restrooms would be likely portable, rather than permanent, if provided at all. A small recreation access point might have gravel parking and paths, and limited seating. In some cities, neighborhood groups, utilizing donations of labor and material, have managed to accomplish significant improvements to small riverfront parcels at costs less than \$25,000. Work generally consists of site cleaning, inexpensive landscape planting and a few park benches.

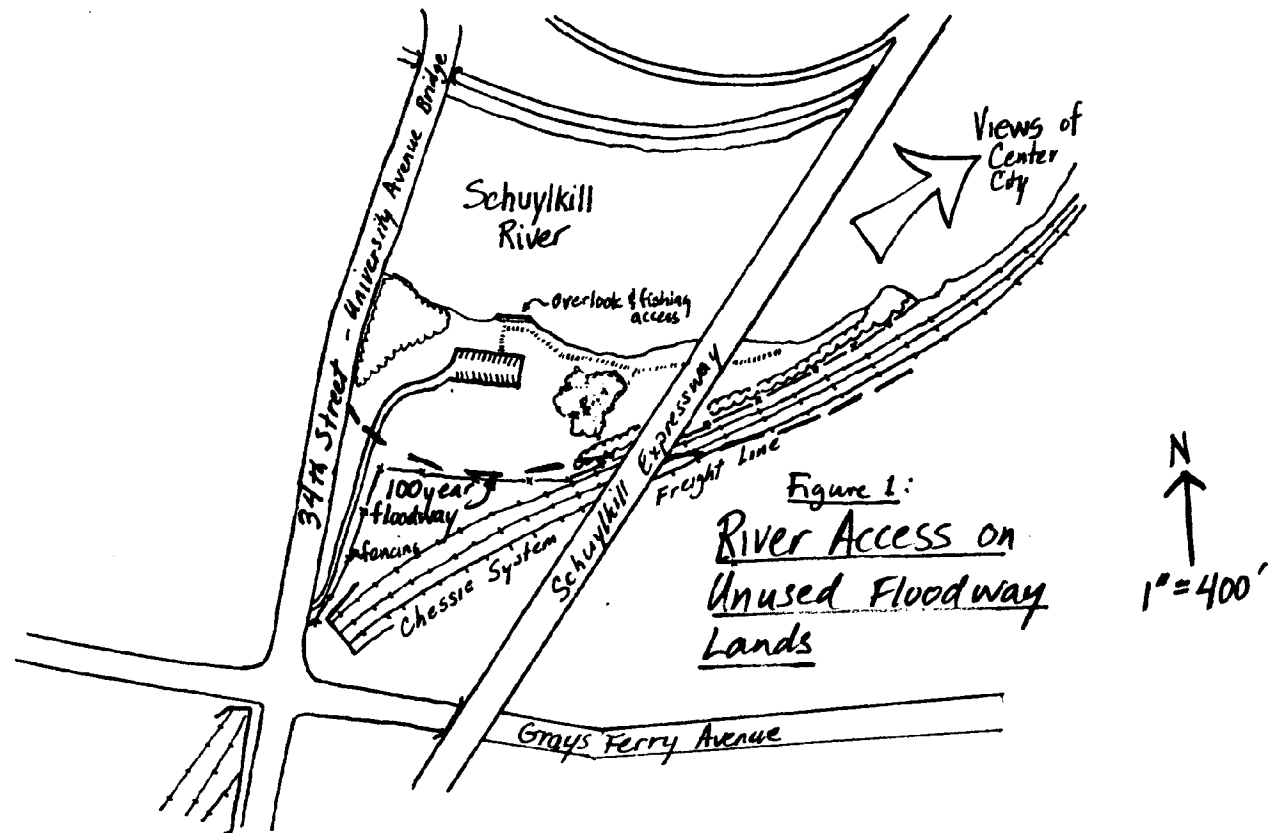
Two other elements of a river access are often in heavy demand, yet are expensive to install. A boat ramp with accompanying parking can be fitted into a site as small as five acres at a cost of \$100,000, but a major facility could be several times larger and in excess of a million dollars in cost. Pier

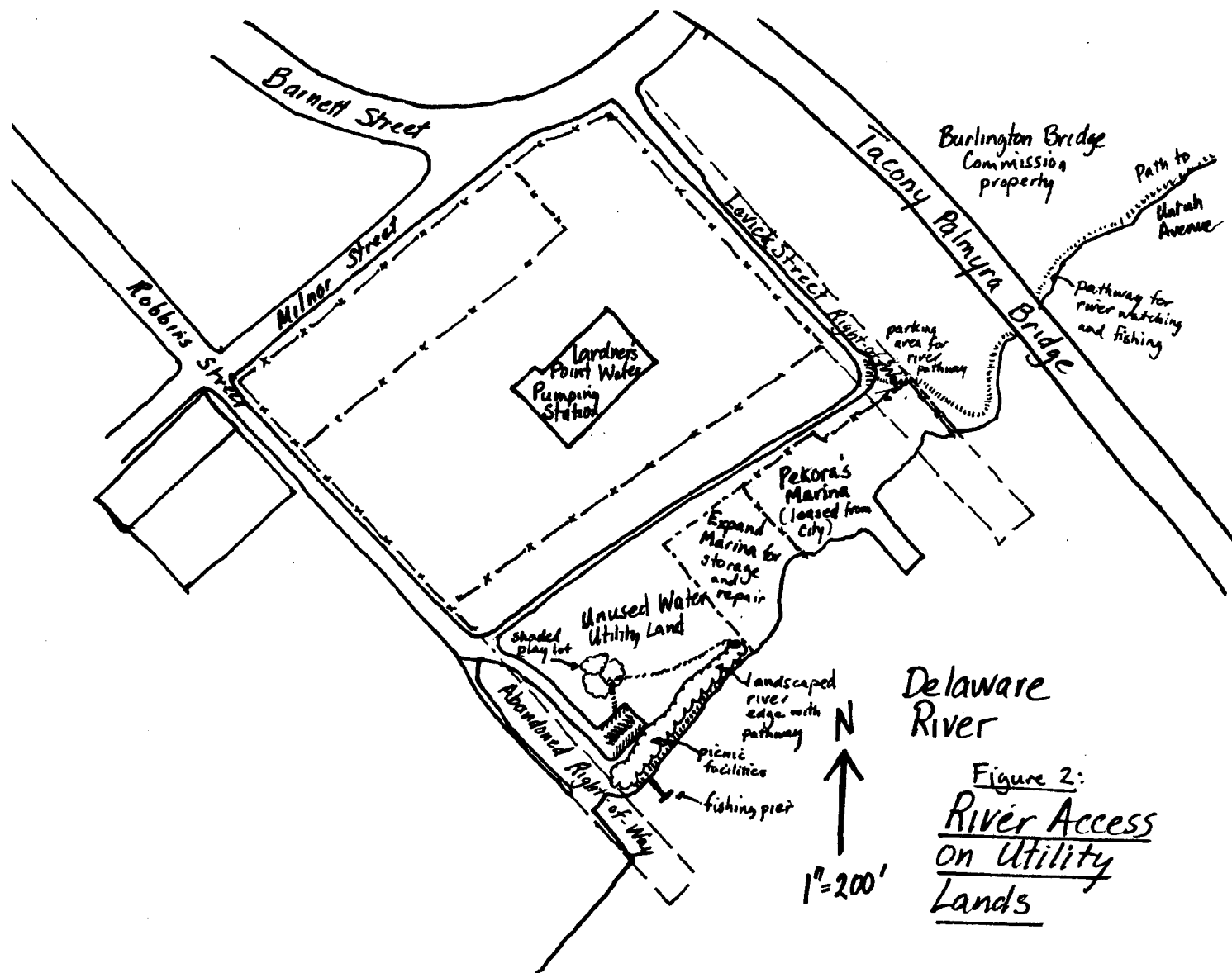
structures for over-the-water access for fishing and river viewing are also costly, approximately \$100,000 for a relatively simple wooden pier when built to withstand ice and flood flows which occur along large rivers.

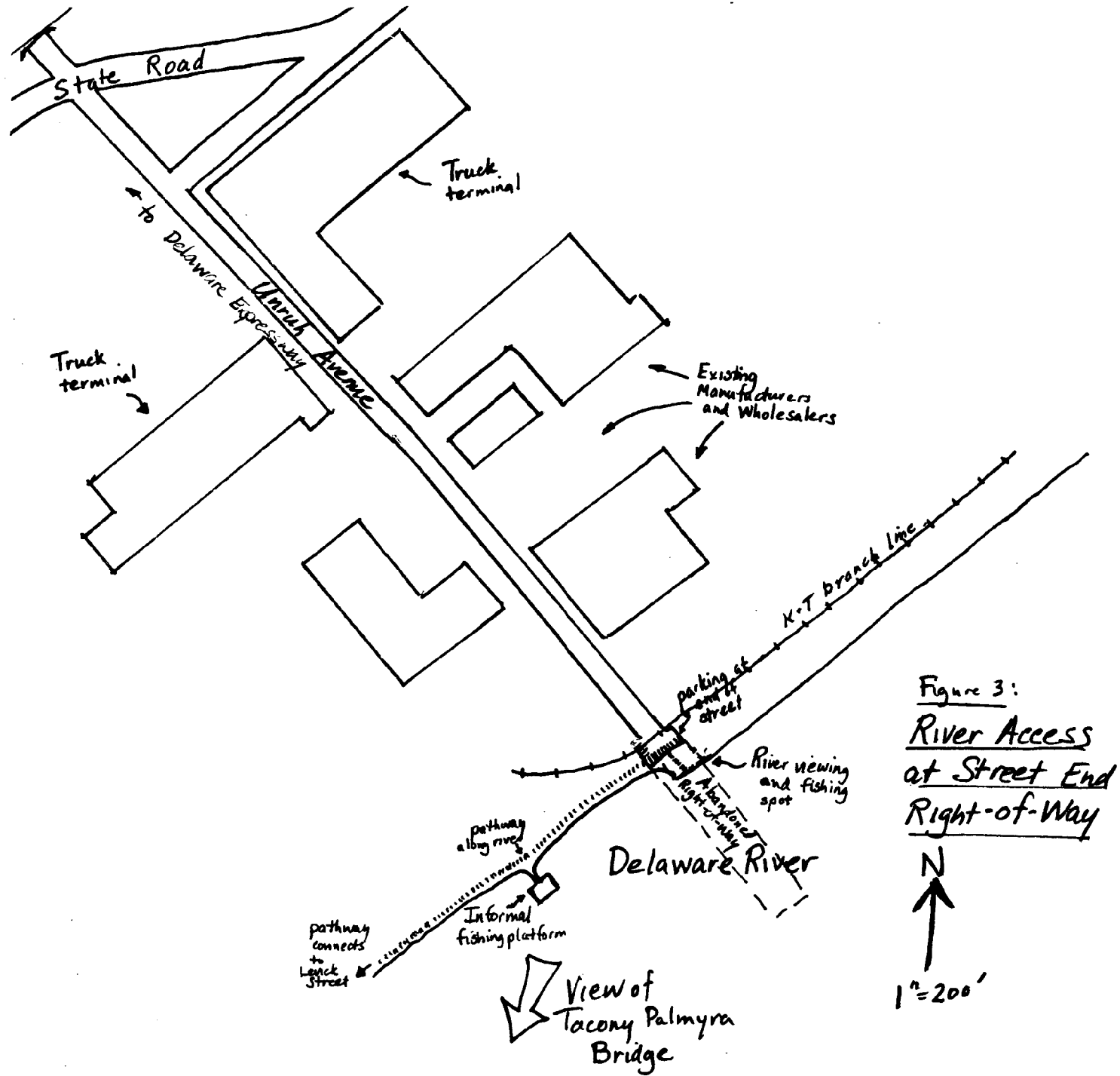
The expense of land acquisition can be a major proportion of project cost. To the extent that this cost is not borne by the public sector, project feasibility can be enhanced. A discussion of the potential role of private landowners in the provision of recreational access is discussed in Item 2.

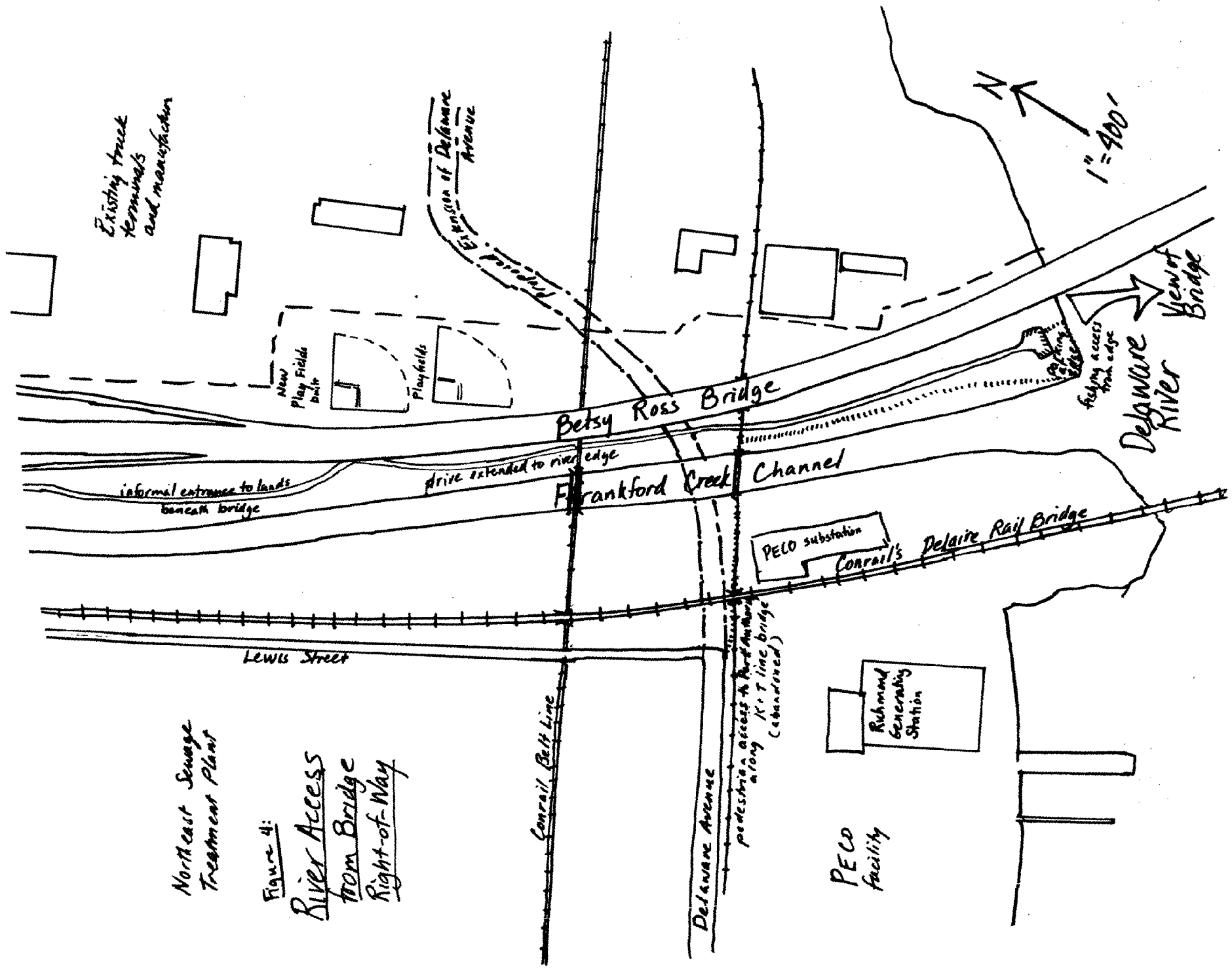
River Access Prototypes











Northeast Sewage
Treatment Plant

Figure 4:

River Access
from Bridge
Right-of-Way

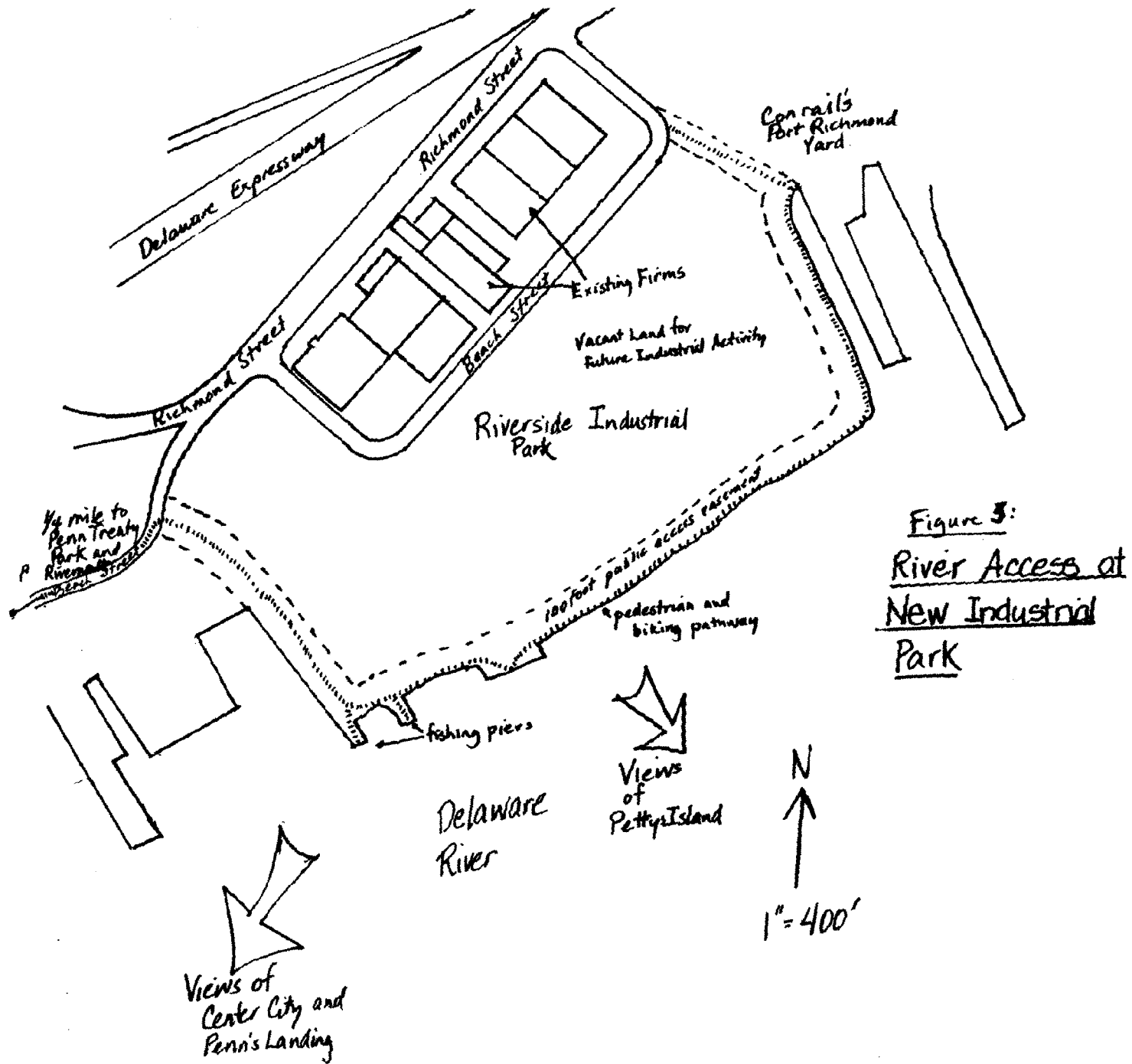
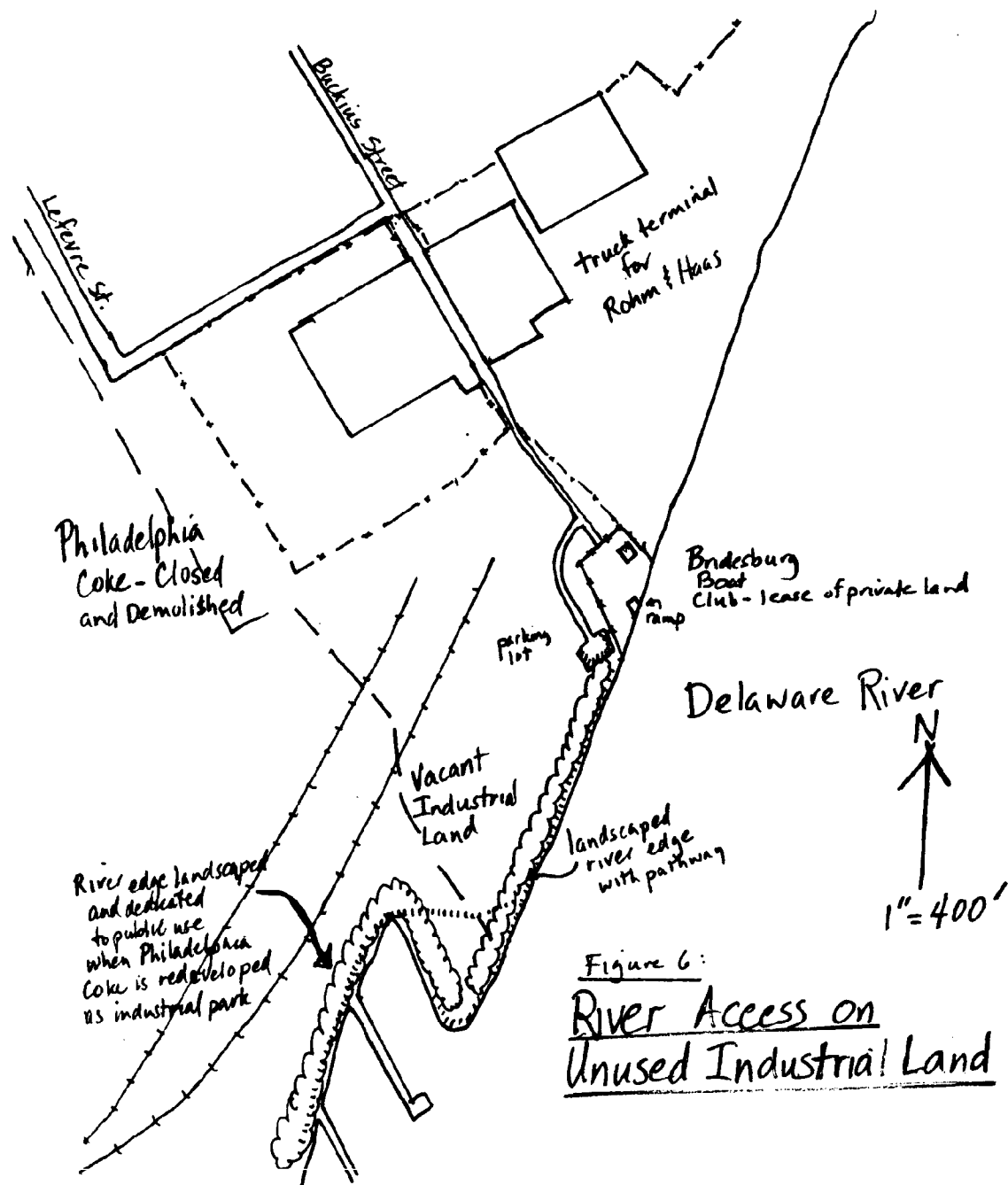


Figure 3:
River Access at
New Industrial
Park



Item 2: Public Recreational Access on Private Land

Business firms and utilities control 80 percent of the riverfront of the Delaware and Schuylkill Rivers. Private residential land use is rare along the rivers, being confined to the short stretches of riverfront at upriver reaches of both rivers. And, whereas bulkheading and landfill have virtually obliterated tidal lands, the public trust doctrine does have significant application in the City. Significant expansion of recreational access in the decade of the 1990's and beyond must involve lands that are currently owned by business firms and utilities. Several important factors will influence the availability of private land for future recreational use. These factors are described below:

Compatibility Between Industrial and Recreational Activities. Reluctance to make riverfrontage available for recreational use, either formal or informal, is rooted in a fundamental fear that industrial and recreational activities are not compatible. Public policy to encourage recreational use of the riverfront can be suspiciously regarded as containing a message to industrial riverfront property owners that public policy no longer ascribes priority importance to retaining industrial firms at riverfront locations. Except in the unusual circumstances that a firm is clearly responsible for unacceptable environmental hazards, this is not the case; business activity is always of preeminent importance.

Joint recreational and industrial use of riverfront properties must be carefully approached to provide every assurance to a business firm that no threat to his operation will arise. The business firm will need to have satisfactorily answered its concern that a public presence close to its operation will not impose standards of performances which are unreasonable. A firm, by admitting the public to its riverfront, may be exposing river users to noise, traffic, odors, and other products of its business activity which it might fear would give rise to complaints to public officials. However, public officials must continually reassure business owners that the importance of the firm's employment and tax benefits to the City will not jeopardize its standing with the City. The firm should also be reassured that, in view of limitation on liabilities under state statute 68§477-1 to 8, the City would expect no effort on the part of a business to maintain or keep clean its lands used for public recreation.

Property Security. A second fundamental cause of concern of private landowners is the security of their property from vandalism, thefts and fire. A business firm cannot take any action which either its management officials or its insurance company might view as increasing its security or fire risks. Firms differ widely in their vulnerability to unlawful intrusion. Those with outside storage of materials, vehicles, and equipment, those engaged in production of flammable or toxic chemical, and those involved with manufacturing technologically advanced products may feel particularly threatened by the risks of unlawful intrusion.

No public policy encouraging use of private lands should be put forth without an offer to assist with business security. This could take the form of financial assistance toward installing fences, gates, alarms, lighting and other protective devices. It might also be a commitment for increased police surveillance. The City may also encourage firms to work with community groups or sportsmen's organizations using the site so that these groups assist with security measures. A firm might also choose to limit access to a recreational site to members of a particular organization, rather than having a site open to the general public, as a means of exerting control over the risk of vandalism.

Benefits to Business Firms. Participation of businesses in a program to provide recreational access to their riverfronts can be best promoted through demonstrating the significant benefits which firms can derive from doing so.

Recreational access to the river can be an employee benefit. Employees could be provided attractive fishing and boating access in a park-like setting at the river's edge. This kind of facility could be used not only at lunch hours and during other breaks, but perhaps by employees and their families on weekends and holidays.

There are public relations benefits possible to business firms for providing recreation. Where access is provided to a community-based organization, it serves to extend business goodwill into the surrounding neighborhood. In cases where a large constituency is involved, the preparation of an access park can provide metropolitan-wide recognition of a firm's civic action.

The federal tax code provides incentives for business firm donations of land to public agencies or to non-profit, tax-exempt organizations. A firm may deduct the full fair market value of its gift of land on its federal income tax returns. Although the total amount of deductions claimed by a firm cannot exceed 10 percent of its pre-tax profits, the balance of deductions may be carried over to five succeeding years. In the Philadelphia area, the Philadelphia Conservationists and the Eastern Chapter of The Nature Conservancy are two organizations who can assist firms with participating in the tax benefits of land donation. These organizations also aid in government acquisition of valuable lands by holding onto donated property for a short period of time until government can appropriate public funds.

Should a firm choose to restrict its future use of riverfront to solely recreation, a conservation easement may be sold to the City. This reduces the potential real estate tax-liability for the property, which is based largely on the land in its industrial usage. If an easement is donated to the City or to a non-profit, tax-exempt land trust, the donation can be deducted as a contribution and can reduce the firm's federal income tax liability.

Policy Consensus on River Recreation. A fourth factor in the participation of private property owners in a program to provide public access is the degree to which there is consensus on the worthiness of the goal of increasing river recreation. A strong case needs to be set forth to a business firm's

executives that an important public good is to be gained by its participation in a public recreational access program. Each proposal to a business firm must be drafted so as to answer a clear need for recreation in the locality in which the firm is located and so that it constitutes a sensible project in terms of its relationship to larger trends affecting water quality, recreation demand,

and riverfront land use. The public goal for recreational access should be one to which there is common agreement by community, business and political leaders of its strong merits. Such agreement would assure businesses that their participation in a recreational program would be given the full recognition and public relations value it deserves. It also provides the persuasion and encouragement to a firm which is often necessary to accomplish change in corporate policy and procedures.

Item 3: Temporary Recreational Land Use

Temporary recreational access has been investigated as a means of providing needed sites for river enjoyment in cases where development of public parks could not be expected to meet the demand for recreation in the foreseeable future. The concept originated with the recognition that considerable stretches of riverfront in public and private ownership, planned for eventual commercial industrial or port uses, were for the foreseeable future to remain underutilized. Temporary use of such lands for recreation would provide opportunities in advance of the allocation of relatively scarce public funds for development of permanent facilities. The concept of temporary recreational use also grew out of the observation that substantial recreational activities were being undertaken, on an informal and unauthorized basis, on private property.

No published literature has been located which directly examines temporary recreational use. The Journal of Leisure Research, Journal of American Planning Association, and publications of the National Park Services have been reviewed. Park and recreation planners in the Philadelphia metropolitan area and in other regions have been contacted for information pertaining to this topic. No published report has been found which specifically discusses the sanctioned, temporary use of private lands for recreation in an urban setting.

Several concerns have been raised in interviews regarding temporary use for

recreational and cultural activities of lands planned for different uses. The principal concern is the risk that future permanent use will be compromised by the temporary use. This issue has been raised by the Redevelopment Authority of Philadelphia in its lease of cleared urban renewal properties for community gardens and neighborhood sitting areas. The Redevelopment Authority insists on an annual lease, severable at 30 days notice, because it is concerned that its efforts to market the land for redevelopment might suffer from the inability to offer immediate sale. The Authority also is of the opinion, based on experience, that the longer a temporary use has been in place at a location, the firmer a community fixture it becomes and the greater the community resistance to uprooting the use for a permanent one.

Temporary use also faces issues regarding maintenance and liability. A formally designated, yet temporary, assignment of private lands for recreation requires that a private or public organization assure responsibility for the care, maintenance and security of a site. The Redevelopment Authority's experience with gardens and sitting areas indicates that some groups may be not sufficiently well organized to provide adequate care. A formal arrangement for recreational use by an organization might also require its obtaining insurance to cover possible accidents. The insurance may be costly enough as to restrict interest in managing the area.

Temporary use limits the extent to which a site will be provided equipment and conveniences to serve the user. Public or

private agencies responsible for a recreation site will generally only make improvements to a site to the extent that the expected life of the improvement does not exceed the terms of the agreement for control of the site, or at least the expected tenancy of the site. When the contract is on an annual basis, virtually no permanent improvements are likely to occur, and visitors will have to provide their own chairs and shelter. Trash receptacles, safety railing and a suitable parking area should also be provided at the most temporary facilities. With significantly longer tenancy, improvements

might consist of park benches, pathways and landscaping. The cost of electrification and restroom facilities can probably not be provided at temporary facilities, and therefore such facility would not serve well long-term visitors and families. The limited services at a temporary facility would provide a constraint to the viability of the site.

For the reasons set forth above, the concept of temporary use of riverfront lands for recreation has limited applicability for Philadelphia.

Item 4: Methods of River Beautification

The beautification of derelict riverfront properties has been set forth as one of the recommendations of Philadelphia's Plan for River Recreation as a means of complementing the improved water quality and recreational capacity of the Delaware and tidal Schuylkill Rivers. The plan shows proposed stretches of the Delaware River where beautification measures would have the most applicability, based on the existing riverfront use and on projected increases in water recreational activity. But other individual properties, both in public and private ownership, may also be candidates for improvement, although not specifically mapped.

The broad strategy for accomplishing river edge beautification is laid out in the plan. It depends on the initiation of private organizations to raise public awareness and to provide the incentives to property owners to participate. Steps more detailed than those suggested in the plan will have to await recent significant organizational initiatives for city beautification in Philadelphia. Two groups have been instrumental in promoting private endeavors for improving the cleanliness of the city. These are the Pennsylvania Horticultural Society and the Philadelphia Chamber of Commerce. The Pennsylvania Horticultural Society will be making plans for city-wide effort at city beautification, and the river edge beautification proposal set forth in the plan has been submitted to the society for its consideration along with other needs. The principal business organization in the City, the Philadelphia First Corporation, has

provided funding to set up a new promotional and advocacy group, named the Keep Philadelphia Beautiful Committee. The river beautification proposal has been submitted to the director of this organization and several of its board members for its consideration in establishing priorities for action. The river edge beautification proposal in Philadelphia's Plan for River Recreation will have the best opportunity for implementation if made part of the agenda of these two organizations.

Methods of river edge screening and beautification are similar to methods employed for street tree planting and urban park management and for strip mine reclamation. The literature in these areas is extensive, and represented by such symposium proceedings at "Trees for Reclamation", Lexington, Kentucky (October 27-29, 1980), and the "National Urban Forestry Conference," Washington D.C., (November 13-16, 1978). The Forest Service, of the U.S. Department of Agriculture, maintains annually a summary of forestry research of which issues of urban forestry and land reclamation are prominent. Forest Services General Technical Report NE-49, Urban Foresters Handbook, summarized in 1978 research on special topics in urban forestry. One journal, Urban Ecology, frequently publishes research on improved methods of city land restoration.

Based on a review of urban forestry literature, none of which is directly applicable to river edge screening, three factors are of primary importance in the use of vegetation for riverfront beautification. These are summarized below.

Site Preparation. The single most important factor in vegetation survival in the urban environment is the condition of the soil. All river edges along the Delaware consist of fill material, which may vary extremely in its composition, even within a short stretch of riverfront. While the best situation is a riverfront formed of clean fill, free of demolition and scrap material. But most river edge areas in need of beautification are not only likely to consist of coarse, non-soil material, but also to be covered by the remains of scrap and waste material or bulk raw materials. For the most part, these will be unsuitable for vegetative planting, and modification of the land surface at the river edge will be necessary.

There are several steps necessary for site preparation. The first step in site preparation is sampling of the fill material to determine its suitability for plant growth. Where at least two feet of soil or soil-like medium is present on site, no major modifications will be necessary. If the potential root zone is shallower than two feet because of concrete rubble or similar obstructions, the edge will need to be modified by removing old fill and replacing it with a clean soil fill. Sampling procedures should include testing for the nutrient status of the fill, which will lead to specifications for fertilizer amendments. In all likelihood, the physical conditions of the fill should be modified to help assure adequate soil aeration and drainage. This may be achieved by adding organic material, such as composted sludge, wood chips, mulch or peat, into the surface one-foot layer of the soil. The final step of site preparation is fertilization and the neutralization of

the soil pH (either the addition of lime to treat an acid soil, or a specific formulation of fertilizer to give a lime, basic soil a neutral pH).

Permits requiring the approval of DER's Bureau of Solid Waste Management, and possibly other DER permitting bureaus, may be required for projects involving the application of sewage sludge or dredge disposal materials to riverfront properties. Property owners should contact the Bureau of Solid Waste, Division of Residual Waste office in Harrisburg or the DER regional office in Norristown prior to undertaking any sewage sludge/dredged spoil application.

Species Selection and Planting. A second critical factor in the success of river edge beautification is selection of appropriate plant material and use of proper planting techniques.

Substantial research is underway on the development of tree and shrub varieties capable of withstanding urban conditions, such as poor aeration, extreme soil fertility conditions, soil compaction, poor drainage and high wind and sun exposure. Street trees that have proved hardy display resistance to deicing salts, low aeration and calcareous (high pH) conditions. Plants suitable for derelict river areas might also have to deal with low fertility and waterlogged, poorly aerated, depending on topography and the nature of the fill. Varieties of locust, willow, maple (red and silver), sycamore and ash, as well as trees ubiquitous in the city, ailanthus and the princess tree, are some of the trees which have proved hardy to

the urban environment. Consideration of both site and soil conditions at a specific project location will help ensure the selection of appropriate kinds of trees.

Proper planting techniques are critical to successful vegetation establishment. Care must be taken to provide a hole of appropriate dimensions for a tree's root ball, to utilize good soil material around the ball, and to thoroughly water and compact the soil around the roots. Frequent watering during the first several weeks aids in tree survival. Guy wires, trunk wrapping and rodent shields may be necessary to protect a young tree. Trees should also be planted during the late fall or early season, during periods of dormancy, so that they are not faced with immediate needs for water and nutrients.

Another important step in plant establishment is to assure stabilization of the soil surface and protection from wind and water erosion. This can be accomplished by the sowing of a vigorous ground cover of grasses, legumes and other herbaceous plants. A vigorous groundcover requires careful preparation of the soil surface, adequate fertility, and a mulch to protect the seedlings.

Publications are available from several governmental sources on methods of tree planting and care in the City. Sources include the Pennsylvania Department of Environmental Resources, Bureau of Forestry, the U.S.D.A Forest Service and the U.S.D.I. National Park Service. Good fill material for tree planting is available at low cost from the U.S. Army Corps of Engineers at its

dredge spoil basins at the confluence of the Delaware and Schuylkill Rivers. Compacted sewage sludge is a soil amendment that can improve soil fertility and structure and can be made available to property owners at low or no cost. This material can be obtained from the Philadelphia Water Department.

Item 5: Monitoring Program for River Recreation

Substantial changes are taking place to the resources supporting river recreation. New boating facilities will soon be serving the public -- notably the Frankford Arsenal Boat Ramp, the Tacony Boat Ramp, a ramp in Chester City, and at least four facilities on the New Jersey side of the Delaware River. Water quality will also be registering major improvements, as sewage treatment plants in Philadelphia and upriver at Trenton become fully operational and make fishing and water skiing more attractive than in the past. These factors promise a significant increase to the level of boating and fishing.

The public benefit derived from investment in pollution control and boating facility development can be best demonstrated through monitoring, over a number of years, the growing recreational use of the Delaware River. A monitoring program is proposed below which may be able to provide base data upon which estimates of benefits can be estimated.

The Pennsylvania Fish Commission is recommended to take the lead in monitoring boating and fishing activity on the Delaware River. The Fish Commission currently conducts a periodic survey of boating and angling use. Waterway patrolmen count power and non-power boats, and fishermen on the shoreline and in boats, and the survey is supplemented by the area fishery manager's survey of physical, biological and chemical conditions of the stream and of social and

land use characteristics along its length. Counts are made at four hour intervals on weekends and holidays and on select weekdays during the boating season. Although the survey procedure may be subject to considerable error, it should be continued nevertheless, with perhaps an attempt to make the data more accurate than in the past by making sampling procedures more regular and precise.

The Pennsylvania Fish Commission should conduct a creel survey along the Delaware River. The survey could consist of use of standardized survey forms by interviewers with fisherman at fishing spots along the river and with fisherman returning in boats to clubs and launch facilities. The creel survey would provide a profile of the characteristics of the fishing public, as well as information on the fish species which are being caught.

Supplementing the two surveys, the Pennsylvania Fish Commission should utilize fish license and boat registration data to provide measures of increased in river-based recreation. An examination of boat registrations have proved a useful index to expanded boating in counties in which recreational reservoirs have been built. Registrations are likely to show a comparable increase in Philadelphia as a result of the opening of the two boating facilities. The Fish Commission might also possibly extract additional information from the registration applications by noting the address and zip code of the boater's place of residence, as well as the location of boat use, so as to demonstrate shifts in the location of boating

activity by those Philadelphians who already own and register boats in Pennsylvania.

The Fish Commission can similarly use fishing license sales to track increased local fishing activity. The data now tabulated by the Commission, sale of licenses by counties in which the license is sold, provides a rough indication of location at which fishing is occurring. It does not, however, provide a record of the home address of the person purchasing the license. As with boating registrations, the Fish Commission would provide data important for analytical use by tabulating license sales by both location of sale and by county of residence, and thereby permit analysis of both increased levels of local fishing, as measured by location of sale, as well as changes to the number of Philadelphians who fish.

Other sources of information may be used to infer the economic effects of increased fishing and boating participation. The City of Philadelphia produces an annual listing of firms paying wage taxes which may be sorted by zip code and two-digit standard industrial code classification. Firms in sporting goods, fishing tackle and bait, and marine supplies can be identified and tracked on an annual basis for significant changes to the City's wage tax received from them, from which total employee wages can be imputed. New firms may be tracked by the public record of fictitious names filed with the state and reported in Focus, a regional business magazine.

The Pennsylvania Department of Environmental Resources, through its recreation planning function, is updating its analysis of

recreation expenditures and recreation participation rates which were last published in 1975. This planning effort should continue to be repeated on a ten year basis, so as to track changes in recreation activities throughout the state. The State might also purchase the services of private consultants, such as the A.C. Nielson Company, to obtain information pertinent to the state and its recreational regions. The Division of Coastal Zone Management might provide funding for a study of the type prepared for Lake Erie on the sport fishing potential of the Delaware Estuary so as to create a base of data against which future surveys could be compared.

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation is an exceptionally useful survey conducted by the Bureau of the Census and the Fish and Wildlife Service. It is conducted every five years, and the next should be made in 1985, for publication in late 1987. This survey should be useful for tracking significant shifts in fishing by two important classifications for Philadelphia population density and race, as Philadelphia has 80 percent of the "big city population" and 60 percent of the state's black residents.

The Pennsylvania Marine Trades Association could be called upon possibly to conduct an annual survey of its members. A survey by this organization might yield estimates of sales volumes, numbers of employees and wages, by county or by region of the state. The Pennsylvania Fish Commission or Department of Environmental Resources might consider providing some funds to this group to assist in a survey effort.

Item 6: Draft Riverfront Zoning District

The proposed riverfront overlay zoning district, similar to a district implemented within the City of Pittsburgh, would impose a requirement for provision of a setback along the riverfrontage for all property abutting a river. The major purpose of the riverfront setback requirement is to encourage the establishment of landscaped open space abutting rivers within the city in conjunction with new development and with substantial rehabilitation. Activities not currently in compliance would not be required to take corrective action unless a permit were sought involving investments in excess of 50 percent of the current value of the property improvements. Further, the ordinance advances the intention of floodplain control ordinances, in that uses which might obstruct passage of floodwater, which might be exposed to flood damages, or which could be swept away by floodwaters would not be permitted close to the river edge. This riverfront yard requirement would pertain, unlike floodplain regulations, only to the Delaware and Schuylkill Rivers, rather than also to tributaries.

(a) Purpose.

This section imposes a requirement for maintenance of a setback along a riverfrontage for all uses, lots and parcels which abut a river within the City of Philadelphia, whether or not such land is located within the 100 year floodplain. The purposes of this regulation is to maintain an open space area along the banks of the rivers and to improve the scenic quality of the city's riverfronts.

(b) Area Requirement.

As part of the setback requirements of any underlying zoning district, there shall be provided and maintained a setback of not less than 30 percent the depth of the lot or fifty (50) feet in depth, whichever is less, along the entire riverfrontage of any property abutting a river within the city. No building, structure or use shall extend into a required setback yard along the riverfrontage, nor shall this area be used for surface parking, loading or open storage. Required riverfront setback yards shall be landscaped and maintained in accord with a landscape plan submitted as part of development or rehabilitation documents.

(c) Waiver of Yard Requirement.

The requirement that no structure or use shall extend into a riverfront yard shall not apply to encroachments and obstructions for which permits have been issued by the Pennsylvania Department of Environmental Resources; to recreational or water-related uses such as parks, marinas, facilities for boating and fishing; to industrial docks or river transportation facilities; to piers built between the pierhead and bulkhead lines of the Delaware River; or to municipal or public utility water intake and discharge facilities.

Item 7: Boating and Fishing Projections
Methodology

No reliable estimate of boating and fishing participation by Philadelphians was available at the time Philadelphia's Plan for River Recreation was researched. Therefore, the first step in projecting future participation in water-based sports was to prepare reasonable estimates of current participation. The following data was available for boating and fishing participation:

Pennsylvania Fish Commission -- boat registrations by County (1983); boating and angling use survey (1982); Jan Caveney, waterways patrolman.

Pennsylvania Department of Environmental Resources -- Pennsylvania Recreation Plan (1980); Pennsylvania Recreation Survey (1975).

Richard Kraus, Temple University -- survey of recreation participation among Philadelphians.

National Marine Manufacturers Association -- Boating Statistics 1982 (1983).

A.C. Nielson Company -- Trends in participation sports (1983).

U.S. Bureau Census and Fish and Wildlife Service -- 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, Pennsylvania.

Every statistic of fishing and boating participation by Philadelphians was prepared for this study by comparing, verifying and modifying data from several sources, as no single source provided a comprehensive set of reliable numbers. For fishing participation data, the single most troublesome discrepancy was the high participation rate reported by DER's recreation survey when contrasted to low fishing license sales reported in Philadelphia by the Fish Commission. For boating participation, the DER-reported rate again was far higher than the Fish Commission boat registration data. A second source of boating and fishing participation, the Kraus survey, also reported rates of water-based sports that were apparently exaggerated. A principal explanation for the discrepancy was the participation by Philadelphians in these sports outside the city, in other recreation regions. But even this could not completely explain the wide discrepancy.

Fishing Estimates. Fishing participation estimates relied on the 1980 National Survey as providing the most consistent and reasonable source of data. Data specific for Philadelphia was estimated by extracting from the 1980 survey participation reported by race and by population density. Whereas Philadelphia's population is 80 percent of the reported "big city" fishing participation and Philadelphia's black population is 60 percent of the black population state wide, participation rates within the city were calculated as directly proportional to these two ratios. It was assumed, further, that all of Pennsylvania's "saltwater-only" fishermen were from the Philadelphia metropolitan area, and the number of

saltwater-only Philadelphia fishermen were taken as a proportion of the metropolitan population residing in Philadelphia, but was set slightly higher than this proportion because of the city's comparatively closer location to saltwater than are most of its suburban counties. In a similar fashion, the data for participation among black and white youth were taken as direct proportions to statistics for fishing youth reported for big-city and by race. In addition, the 1980 Survey, which reported a significant number of City fishermen not purchasing licenses, was used to revise upward the number of license sales in the city so as to provide an estimate of the proportion of resident freshwater fishermen using local rivers. These participation rates were double-checked by comparing rate of salt and freshwater fishermen residing in Philadelphia and the metropolitan area, as estimated by the above described proportional estimates, with the participation rate in Allegheny County, which consists of Pittsburgh and surrounding suburban areas. The total fishing participation rates were in reasonably close agreement.

The location of fishing activity by Philadelphians relied on Fish Commission estimates of fishing activity for the Schuylkill and Delaware River, as modified both by its staff expert, and by the field experience of the local waterways patrolman.

The Pennsylvania Recreation Plan and the 1980 survey were used to assign to the number of fishing participants an estimate of total activity days by Philadelphians, and, where this participation could not be reasonably assigned to local stream and rivers based on Fish Commission estimates, it was allocated to other recreation regions.

Projections of future fishing activity were based entirely on professional judgment, as influenced by regional, state and national participation rates. The basic assumption is that participation by city residents would rise to a level not as high as the existing participation rate among suburban residents, which is almost 60 percent higher than that of the city. For this report, the city rate was projected to rise to a level one-half the difference between the 1980 city and suburban rate, or a 30 percent increase in participation. The total fishing activity that this increased rate would create was allocated to local rivers in a fashion consistent with improved facility availability, the implementation of urban fishing programs and improved fishing resources. It assumed, for example, a small, but significant, attraction of some salt-water only fishermen to the Delaware and Schuylkill Rivers.

Boating Estimates. Estimates of boating participation by residents and boating activity in local rivers had to confront two factors. First, a very great amount of boating participation is undertaken by Philadelphians at locations outside the city and in boats which are not owned by them. Second, a significant proportion of Philadelphians who are boat owners have their boats registered and stored outside Pennsylvania and the Delaware Estuary. The task of the planning analysis was to identify the total number of Philadelphia boaters and to assign them to the principal waters in which they engage in this sport.

An estimate was made of total boat ownership by Philadelphians. This was done by examining total boat registrations by states

in Northeast United States, and identifying an "excess" of registrations in those states bordering Pennsylvania based on the number of boats in that state exceeding the average registration in the Northeast and Mid-Atlantic regions of the country. It was assumed that a large proportion of the "excess" boats in Maryland, Delaware and New Jersey was attributable to poor boating facility availability in southeastern Pennsylvania, compared to the other metropolitan areas in these states. Further, the total rate of boat ownership in metropolitan Philadelphia was assumed to be equal to that of Allegheny County, Pennsylvania. This provided the basis for allocating to southeastern Pennsylvania a proportion of the excess boat in neighboring states. The allocation of boats to city residents was made as a proportion to the ratio of suburban boat registrations to city boat registrations.

Total boating participation among Philadelphians was an estimate based on a comparison of local, state and national surveys, adjusted downward by a professional judgment that participation reported in surveys exaggerated actual participation. This participation was converted into total boating activity and peak boating based on Pennsylvania Recreation Plan data. Total boating activity by Philadelphians was assigned to different water bodies by a judgment of the relative attractiveness of other boating regions and related factors. Boating activity on local rivers was assigned on the basis of Pennsylvania Fish Commission boating use estimates and surveys for the Delaware and Schuylkill Rivers.

The projection of potential boating ownership was based on the premise that the rate of ownership for the metropolitan region would one day approach the average ownership rate for rural counties and towns. The metropolitan rate would be composed of a suburban and urban components; the urban component would be a rate one half the suburban rate. Based on this projection, the boat ownership rate for the metropolitan area and for Philadelphia would increase 40 percent.

Projections of boating participation among Philadelphians was an extension of the projection of boat ownership. It was assumed that for each additional boat owned by a resident and registered in the city that, on average, fifteen additional residents (guests and relatives) would, at some time in the year, also use the boat. This is based on state and national statistics of boat registrations versus boating participation. The projected boating participation was a 30 percent average increases over existing participation, reflecting the judgment that the rate of additional participation might not rise as steeply as boat ownership in response to additional facility development in the city. This participation was allocated to different water bodies and recreational areas on the premise that local rivers would gain in attractiveness and convenience relative to competing locations as planned facilities are developed. Projections of boat ownership and boating participation were compared to existing conditions in other states and regions and were determined to be conservative and within levels typical in other metropolitan areas.

TABLE A1: ESTIMATION OF PHILADELPHIA'S FISHING POPULATION

Category of Fishing	Total Population	Fishermen	Percentage of Total Population
<u>Adult</u>			
White			
Fresh; Fresh and Saltwater		23,000	
Saltwater Only		59,000	
Total White	850,000	82,000	9.6
Black			
Fresh; Fresh and Saltwater		11,000	
Saltwater Only		22,000	
Total Black	480,000	33,000	6.9
Total Adult	1,330,000	115,000	8.6
<u>Youth</u>			
White	130,000	32,000	24.6
Black	120,000	13,000	10.8
Total Youth	250,000	45,000	18.0
TOTAL	1,580,000	160,000	10.1

SOURCE: Philadelphia City Planning Commission estimates derived from Pennsylvania Fish Commission, "1981 Fishing License Sales," and the U.S. Departments of Commerce and Interior 1980 National Survey of Fishing, Hunting and Wildlife-Associated Recreation: Pennsylvania.

TABLE A2: FISHING ACTIVITY ON THE DELAWARE RIVER, BY SEGMENT

County and Segment	Length (mile)	Water Surface (Acres)	Angling Days/ Year (ADY)	<u>ADY</u> mile	<u>ADY</u> acre
Delaware County					
3G	14.6	10,200	5,000	342	.49
Philadelphia					
3F	1.3	800	1,000	769	1.3
3J	18.3	8,200	40,000	2,186	4.9
Bucks County					
2F	4.4	1,300	5,000	1,136	3.8
2E	19.5	2,600	25,000	1,282	9.6
TOTAL	58.1	23,100	76,000	1,308	3.3

Source: Pennsylvania Fish Commission, Computerized Inventory of boating and fishing survey data, January 13, 1981, modified by Fred Johnson. Philadelphia City Planning Commission, measurement of water surface area.

TABLE 43: DISTRIBUTION OF PHILADELPHIA FISHERMEN BY WATERS FISHED

Location	Adult	Youth	Total
Delaware River-Shore	1,000	1,000	2,000
Delaware River-Boat	2,000	2,000	4,000
Schuylkill River	15,000	10,000	25,000
Wissahickon Creek	10,000	12,000	22,000
Other Tributaries		1,000	1,000
Ponds		1,000	1,000
Rural Streams	6,000	3,000	9,000
Shore or Bay	81,000	15,000	96,000
TOTAL	115,000	45,000	160,000

Source: Philadelphia City Planning Commission estimates based on 1980 National Survey of Fishing, Hunting and Wildlife-Associated Recreation: Pennsylvania and telephone conversation with Jan Caveney, Pennsylvania Fish Commission, October 19, 1983.

TABLE A4: BOATING ACTIVITY ON THE DELAWARE RIVER, BY SEGMENT

<u>County and Segment</u>	<u>Length (mile)</u>	<u>Water Surface (acre)</u>	<u>Boating Days Per Year (BDY)</u>	<u>BDY mile</u>	<u>BDY acre</u>
Delaware County					
3G	14.6	10,200	25,000	1,712	2.5
Philadelphia					
3F	1.3	800	5,000	3,846	6.3
3J	18.3	8,200	67,000	3,661	8.2
Bucks County					
2E	4.4	1,300	50,000	11,363	3.8
2F	19.5	2,600	7,000	359	2.7
TOTAL	58.1	23,100	154,000	2,651	6.7

Source: Pennsylvania Fish Commission, computerized inventory of boating and fishing survey data, January 13, 1981. Philadelphia City Planning Commission, measurement of water surface area.

TABLE A5: ESTIMATED BOAT OWNERSHIP BY RESIDENTS OF PHILADELPHIA METROPOLITAN AREA AND OTHER GOVERNMENTAL UNITS

COUNTY	TOTAL POPULATION	BOATS REGSTRD IN-STATE	REGISTRATION Per 1000	BOATS REGSTRD ELSEWHERE	TOTAL BOAT OWNERS	OWNERSHIP PER 1000
Philadelphia	1,688,200	4,300	2.5	12,700	17,000	10.0
Bucks	479,200	8,100	16.8	1,500	9,600	
Chester	316,700	2,700	8.5	3,600	,300	
Delaware	555,000	3,200	5.8	7,900	11,100	
Montgomery	643,600	6,300	9.8	6,600	12,900	
Philadelphia Suburbs	1,994,500	20,300	10.1	19,600	39,900	20.0
Philadelphia Metro Area	3,682,700	24,600	6.7	32,300	56,900	15.5
N.J., Suburbs of Philadelphia	1,342,000	5,960	4.4	15,000	20,960	15.6
Allegheny County	1,450,100	23,100	15.9	0	23,100	15.9
Pennsylvania	11,864,000	197,580	16.7	Not Estimated	Not Estimated	Not Estimated
Rural Penna.	5,657,000	126,685	22.4	Not Estimated	Not Estimated	Not Estimated
United States	226,546,000	8,941,217	39.5	Not Applicable	Not Applicable	Not Applicable

SOURCE: Pennsylvania Fish Commission, Bureau of Waterway "Boat Registration by County," December 8, 1982.
Philadelphia City Planning Commission estimates of out-of-state boat registrations.

TABLE A6: COMPARISON OF BOAT REGISTRATION AMONG STATES IN NORTHEASTERN UNITED STATES

State	Population (1000)	1982 Boat Registration	Registration Per 1000 Capita
Conneticut	3,108	67,078	21.5
Delaware	594	34,861	58.7
District of Columbia	638	3,786	5.9
Maryland	4,217	137,719	32.7
Massachusettes	5,737	181,699	31.7
New Jersey	7,365	130,922	17.8
New York	17,558	321,881	18.3
Pennsylvania	11,864	197,580	16.7
Rhode Island	947	25,189	26.6
Virginia	5,347	139,694	26.1
TOTAL	57,375	1,240,409	21.6

Source: "Boating," (an annual statistical abstract) National Marina Manufacturing Association.
Statistical Abstract of the United States, 1982-1983. U.S. Department of Commerce,
 Bureau of the Census.

TABLE A7: ESTIMATES OF BOAT OWNERSHIP AND BOATING PARTICIPATION BY PHILADELPHIANS, COMPARED TO PENNSYLVANIA AND UNITED STATES

<u>Source of Estimate</u>	<u>Boat Ownership</u>	<u>Ownership per 1000 Capita</u>	<u>Boating Participation</u>	<u>Participation Per 1000 Capita</u>	<u>Participation Per Boat</u>
<u>Philadelphia</u>					
Pennsylvania Recreation Survey 1974			440,000	260	
Temple University Survey			295,000 to 370,000	174 218	
City Planning Commission - estimate	17,000	10.0	250,000	150	15.0
<u>Pennsylvania</u>					
Pennsylvania Fish Commission; Pennsylvania Recreation Plan	197,580	16.7	4,021,896	339	20.4
<u>United States</u>					
National Marine Man. Assoc. Nielsen Marketing (1982)	8,941,217	39.7	60,711,000 52,600,000	268 232	6.8

Source: Pennsylvania Recreation Survey: The Local Point of View, Ide Associates, Inc. for Commonwealth of Pennsylvania, 1975. Richard Kraus, Temple University, telephone conversation with author July 8, 1983. Pennsylvania Fish Commission, Bureau of Waterways, "Boat Registration by County," December 1982. R. J. Halstenrud, A. C. Nielson Company, "Trends in Participation Sports," April 25, 1983. National Marine Manufacturers Association, "Boating," (an annual statistical abstract).

TABLE A8: ESTIMATES OF ACTIVITY LOCATION BY PHILADELPHIA BOATERS

<u>Location</u>	<u>Participants</u>	<u>Percentage Of Participants</u>
<u>In Philadelphia</u>		
Delaware River	20,000	8
Schuylkill River	3,000	1
<u>Outside Philadelphia</u>		
Delaware River	17,000	7
Lakes and Rivers	10,000	41
Shore and Bay	200,000	80
TOTAL	250,000	100

Source: Philadelphia City Planning Commission estimate, based on Temple University survey, interview with Joseph Sweeney, Schuylkill Navy member; Pennsylvania Fish Commission boating activity survey; Pennsylvania Recreation Plan; Bob Rasmussen, concessionaire at the Strawberry Mansion Boat House; and, Planning Commission surveys of yacht clubs.

TABLE A9: PROJECTED BOAT OWNERSHIP IN METROPOLITAN PHILADELPHIA

County	Existing			Projected		
	Registered At Home	Registered Elsewhere	Total	Registered At Home	Registered Elsewhere	Total
Philadelphia	4,300	12,700	17,000	9,000	13,000	23,000
Bucks	8,100	1,500	9,600	9,000	1,500	10,500
Chester	2,700	3,600	6,300	3,200	4,800	7,000
Delaware	3,200	7,900	11,100	6,000	8,000	14,000
Montgomery	6,300	6,600	12,900	6,900	6,600	13,500
New Jersey	6,000	15,000	21,000	8,000	15,000	23,000
TOTAL	30,600	47,300	77,900	42,100	47,900	90,000

SOURCE: Philadelphia City Planning Commission estimates based on State statistics and comparison to ownership statistics of comparable states and counties, 1983.

TABLE A10: PROJECTED ANNUAL BOATING ACTIVITY ON THE DELAWARE AND SCHUYLKILL RIVERS

<u>River</u>	<u>Existing Boating Days/Year</u>	<u>Projected Boating Days/Year</u>
<u>Delaware River</u>		
Delaware County	25,000	100,000
Philadelphia	72,000	200,000
Bucks county	57,000	200,000
Schuylkill River	75,000	100,000
TOTAL	229,000	600,000

SOURCE: Philadelphia City Planning Commission estimates, 1983.

TABLE A11: DELAWARE RIVER RECREATIONAL USE SURVEY TACONY PALMYRA BRIDGE TO NESHAMINY CREEK (8 miles)

	<u>APRIL AND MAY</u>		<u>JUNE TO LABOR DAY</u>		<u>POST LABOR DAY</u>	
	Avg. of Daily High Count	Avg. of First Quartile of High Counts	Avg. of Daily High Counts	Avg. of First Quartile of High Counts	Avg. of Daily High Counts	Avg. of First Quartile of High Counts
<u>Weekday</u>						
Angling						
- Shore	8	11	11	22	9	16
- Boat	1	3	1	3	0	1
Boating						
- Power	6	11	14	25	8	14
- Non-Power	2	4	4	8	5	13
<u>Weekend and Holiday</u>						
Angling						
- Shore	38	68	32	61	18	32
- Boat	8	18	7	19	8	21
Boating						
- Power	33	68	71	146	32	60
- Non-Power	23	60	27	55	27	73

Source: Pennsylvania Fish Commission raw counts 1981; Philadelphia City Planning Commission analysis.

TABLE A12: COMPARISON OF BOAT FACILITY DEMAND WITH EXISTING AND PROPOSED CAPACITIES

Location and Facility	Total Boats	Current Peak Demand	Future Boats	Projected Peak Demand	Current Capacity	Proposed Capacity	Deficit
<u>Metropolitan Area</u>							
Slips and Moorings	4,500	4,500	5,000	5,000	3,000	3,175	1,825
Boat Launches	25,500	5,100	37,000	7,400	3,100	3,800	3,600
<u>City</u>							
Slips and Moorings	650	650	800	800	200	200	600
Boat Launches	3,650	730	8,350	1,670	200	520	1,150

SOURCE: Based on Planning Commission estimates of boat ownership, participation, peak demand and future conditions and interviews with operators/owners concerning proposed capacity additions, 1983.

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